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Mathias Drton and **Han Xiao***, Department of Statistics, 5734 S. University Ave, Chicago, IL 60637. *Smoothness of Gaussian conditional independence models.*

Conditional independence in a multivariate normal/Gaussian distribution is characterized by the vanishing of subdeterminants of the distribution's covariance matrix. Gaussian conditional independence models thus correspond to algebraic subsets of the cone of positive definite matrices. For statistical inference in such models it is important to know whether or not the model contains singularities. Following prior work by Lnenicka and Matus (2007), we present exhaustive computations of the singular loci of models involving up to four random variables. (Received January 28, 2009)